# ABSTRACT

This research describes the utilization of drones, artificial intelligence (AI), and computer vision, specifically using the YOLOv8 algorithm, in the rapid and accurate measurement and classification of tree height. Trees play a vital role in ecosystems and climate change, and tree height data is crucial for environmental research, forest conservation, and natural resource management. Manual tree height measurements are conducted using two methods, direct and indirect measurement, but these methods require more time and human resources.

With advancements in drones, AI, and computer vision technology, this process can be optimized, saving time and human resources. The use of drones enables access to hard-to-reach areas, while AI with the YOLOv8 algorithm optimized for computer vision can automatically detect and identify trees in images or real-time videos. The main challenge is the limited dataset to train the AI model, but advancements in drone, AI, and computer vision technology offer significant potential to enhance efficiency and accuracy in tree height analysis.

The results of this research demonstrate that the use of drones and the YOLOv8 algorithm is an efficient and accurate combination for tree height measurement and classification. The developed model has a performance value of 88.57% precision, 86.14% recall, 93.98% mAP50, and 68.10% mAP50-90. Additionally, the developed system has good accuracy with an average confidence score of 87%, an error rate of 36%, and an accuracy of 64%. This technology has significant potential to support various applications, including forest growth monitoring, natural resource conservation, and assessing the impact of climate change on ecosystems. However, it should be noted that further improvements in the algorithm and other technical adjustments can continue to enhance the performance and potential of this system in the future.

**Keywords: Algoritma YOLOv8, Drone, Artificial Inteligent, Classification, Computer Vision.**